



UNIVERSITI PUTRA MALAYSIA

**EXPERT SYSTEM FOR RATING OF ECOTOURISM
SITES BASED ON SAFETY, HEALTH AND ENVIRONMENTAL
QUALITY ASSURANCE**

VIKNESWARAN NAIRSEHKARAN

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**EXPERT SYSTEM FOR RATING OF ECOTOURISM SITES BASED ON
SAFETY, HEALTH AND ENVIRONMENTAL QUALITY ASSURANCE**

BY

VIKNESWARAN NAIR SEHKARAN

**Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia,
in Fulfilment of the Requirements for the Degree of
Doctor of Philosophy**

June 2003



Specially dedicated to...

Mum and dad,

My beloved wife Banunsthy Devi,

Sister Shoba and brother Ramesh

Brother-in-law Steven

Abstract of thesis submitted to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Doctor of Philosophy

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June 2003

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Faculty : Engineering

The environment is the backbone of tourism products. Profitability in tourism depends on maintaining the attractiveness of tourist destinations with pleasant environment. Malaysia is a tropical country that is rich in a variety of ecological resources that of high tourism potential. Hence, the condition of the environment plays a critical role if the industry is to be sustained for future generations. The concept of ecotourism emphasises the sites that has potential for ecological interest. Although the ecotourism industry in Malaysia has vast potential for further development, it has not received adequate attention. All ecotourism sites must be planned, guided and developed in a monitored and controlled manner for effective and efficient management. A systematic expert rating system is developed to maintain a certain level of standards based on different levels of categorisation to ensure the sustainability of ecotourism sites in Peninsular Malaysia. The expert system developed uses a Web-based information-sharing platform consistent with the existing legislation on safety, health and environment. The system is designed and developed on a back-end on-line

database, which will keep record of all successful transactions. This research presents an efficient model using the Active Server Pages scripting method to manage and deliver the ecotourism rating expert system.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia untuk memenuhi keperluan Ijazah Doktor Falsafah

**SISTEM KEPAKARAN PENILAIAN EKO-PELANCONGAN
BERDASARKAN KEPADA JAMINAN KUALITI KESELAMATAN,
KESIHATAN DAN ALAM SEKITAR**

Oleh

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Alam semulajadi merupakan tunjang sektor pelancongan negara. Hasil keuntungan yang diperolehi daripada industri pelancongan ini bergantung kepada daya tarikan sesuatu destinasi pelancongan yang kaya dengan keindahan alam semulajadi. Malaysia merupakan sebuah negara yang dikurniakan dengan keajaiban tropical, kaya dengan pelbagai tarikan ekologi. Hal ini telah menjadikan Malaysia berpotensi sebagai destinasi eko-pelancongan. Oleh itu, keadaan alam semulajadi memainkan peranan yang kritikal untuk mengekalkan industri ini untuk generasi yang akan datang. Konsep eko-pelancongan mengutamakan destinasi-destinasi pelancongan yang mempunyai kepentingan ekologi. Walaupun industri eko-pelancongan di Malaysia mempunyai potensi yang luas untuk pembangunan, namun konsep pelancongan ini masih belum mendapat perhatian yang sewajarnya. Destinasi-destinasi eko-pelancongan harus dirancang, diterokai dan dibangunkan pengawasan dan pengawalan untuk memastikan pengurusan yang cekap dan berkesan. Oleh itu, satu system penilaian yang pakar telah dihasilkan untuk menilai dan mengenalpasti serta

mengkategorikannya kepada tahap-tahap tertentu. Tahap-tahap ini akan digunakan untuk mengenalpasti tahap pengelasan destinasi-destinasi eko-pelancongan di Semenanjung Malaysia. Sistem kepakaran ini direka bentuk dan dibangunkan berasaskan kepada “Platform perkongsian maklumat melalui laman Web” yang berpandukan kepada undang-undang keselamatan, kesihatan dan alam sekitar yang sedia ada dimana segala urusan yang berjaya akan direkodkan. Sistem ini menggunakan pangkalan data “*back-end on-line*”. Kajian ini dirangka menggunakan kaedah menskriptasikan “Active Server Pages” yang menurus dan meyampai membentangkan sebuah model yang menggunakan cara skriptasi “*Active Server Pages*” yang mengurus dan menyampaikan sistem kepakaran penilaian eko-pelancongan.

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The study has been a great experience and has given me valuable insight into the field of information technology in environment. I submit in humility and gratitude to the Supreme Power for all his blessings and generous help from sources that were beyond our expectation.

I certify that an Examination Committee has met on 23rd May 2003 to conduct the final examination of Vikneswaran Nair Sehkan on his Doctor of Philosophy thesis entitled "Expert System for Rating of Ecotourism Sites Based on Safety, Health and Environmental Quality Assurance" in accordance with Universiti Pertanian Malaysia (Higher Degree) Act 1980 and Universiti Pertanian Malaysia (Higher Degree) Regulations 1981. The committee recommends that the candidate be awarded the relevant degree. Members of the Examination Committee are as follows:

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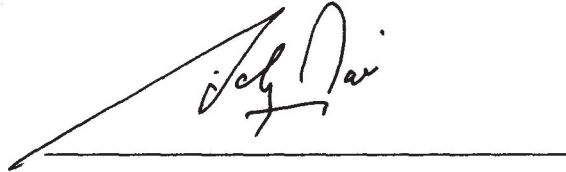
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DECLARATION

I hereby declare that the thesis is based on my original work except for quotations and citations, which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at UPM or other institutions.

A handwritten signature in black ink, appearing to read 'Vik Nair', is written over a horizontal line.

VIKNESWARAN NAIR SEHKARAN

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TABLE OF CONTENTS

	Page
DEDICATION	ii
ABSTRACT	iii
ABSTRAK	v
ACKNOWLEDGEMENTS	vii
APPROVAL SHEETS	viii
DECLARATION FORM	x
LIST OF TABLES	xiv
LIST OF FIGURES	xvii
LIST OF ABBREVIATIONS	xix
 CHAPTER	
 1 INTRODUCTION	 1
1.1 Prologue	5
1.2 Problem Statement	4
1.3 Research Objectives	11
1.4 Scope of Study	12
1.5 Expected Output of the Research	12
 2 LITERATURE REVIEW	 13
2.1 Tourism	13
2.2 Ecotourism	20
2.2.1 Ecotourism Definition and Principles	21
2.2.2 Ecotourism Growth and Development	27
2.2.3 Ecotourism Evaluation, Monitoring and Code of Practice	28
2.3 Ecolabelling	29
2.4 The Status of Ecotourism in Malaysia	30
2.5 Natural Resources	36
2.6 Natural Resources and It's Attraction	37
2.7 Safety, Health and Environment	40
2.8 Carrying Capacity	41
2.9 Tourism Planning	43
2.10 Rating and Evaluation Systems	44
2.10.1 Rating and Evaluation Approaches in the Hospitality Industry	46
2.10.2 Rating and Evaluation Approaches in the Tourism Industry	49
2.11 Information Communication Technology (ICT) for Travel and Tourism	53
2.12 Nature of Expertise	55
2.13 Expert Systems(ES)	55
2.14 Expert System Shell	56
2.15 Expert System Development Life Cycle	57
2.16 Inference	59
2.16.1 Forward-chaining	59
2.16.2 Backward-chaining	60

2.17	ES and Artificial Intelligence	61
2.18	Dynamic Web Page	62
2.19	Client-side Processing and Server-side Processing	62
2.19.1	Common Gateway Interface (CGI)	63
2.19.2	Active Server Pages (ASP)	64
2.20	ASP Application in Expert Rating System	66
2.21	Summary	67
3	METHODOLOGY AND DESIGN	69
3.1	Conceptual Framework	69
3.2	Data Collection	72
3.3	Instrumentation and Scales	76
3.4	Pre-testing of Questionnaire and Reliability of Scales	77
3.5	Data Analysis	79
3.6	Expert System Development Tools	81
4	KNOWLEDGE ACQUISITION ANALYSIS	83
4.1	Prelude	83
4.1.1	Profile of Respondent	83
4.1.2	Correlation Analysis	88
4.2	Frequency Distribution and Analysis	90
4.3	Factor Analysis	101
4.3.1	Correlation Matrix	101
4.3.2	KMO and Bartlett's Test	104
4.3.3	Communalities	105
4.3.4	Total Variance Explained	108
4.3.5	Factor Matrix	113
5	EXPERT SYSTEM DEVELOPMENT	119
5.1	Expert System Process	119
5.1.1	Phase 1: Assessment	120
5.1.2	Phase 2: Knowledge Acquisition	120
5.1.3	Phase 3: Design	121
5.1.4	Phase 4: Testing	144
5.1.5	Phase 5: Documentation	145
5.1.6	Phase 6: Maintenance	145
5.2	Graphical User Interface (GUI)	146
5.3	Rating System Developed	155
5.3.1	Rating Model Algorithm	155
5.4	System Verification	158
5.4.1	Proposed Rating Scale	163
5.5	Validation and Evaluation	166
6	CONCLUSION AND RECOMMENDATIONS	178
6.1	Conclusions	178
6.2	System Capabilities and Limitations	182
6.3	Recommendations and Further Research	184
	REFERENCES	188
	APPENDICES	199

A	Malaysia – Tourist Arrivals 2000-2001	200
B	Directory of Tourism Ecolabels	201
C	Sample Survey Questionnaire	207
D	Fréquency Table for Data Analysis	216
E	Histogram for Data Analysis	235
F	Factor Matrix Analysis Result	246
G	Knowledge Acquisition for ecotourES	254
H	Criteria for ecotourES Minimum Requirement for Rating	284
VITA		319

LIST OF TABLES

Table		Page
2.1	Distribution of Hotel Guest Night by State 1998	15
2.2	Dimensions and Interpretation of Ecotourism	21
2.3	Interpretation of Ecotourism	25
2.4	Diagnostic Factors Used in Classifying Ecotourism Sites in Malaysia	32
2.5	Types of Attractions as Classified in the National Ecotourism Plan Malaysia	34
2.6	Types of Activities as Classified in the National Ecotourism Plan Malaysia	34
2.7	National Ecotourism Plan Guidelines	35
2.8	Qualmark Star Scale System	49
2.9	Ecotourism Scaling Level by Shores (1999)	51
3.1	Sample Composition Based on Ecotourist Distribution in Peninsular Malaysia	75
3.2	Sampling Locations in Peninsular Malaysia	76
3.3	Summary of reliability analysis for pre-test	78
4.1	Profile of Sample	86
4.2	A Bivariate Correlation Test Result	89
4.3	Summary of Mean and Standard Deviation of Sample for Ecotourism Definition	91
4.4	Ecotourism Advisory Panel Details	92
4.5	Summary of Mean and Standard Deviation of the Main Attributes	93
4.6	Coefficient for Filtration Module of ecotourES	94
4.7	Summary of Mean and Standard Deviation of Safety Attributes	96
4.8	Summary of Mean and Standard Deviation of Health Attributes	97
4.9	Summary of Mean and Standard Deviation of Environmental Attributes	98
4.10	Summary of Mean and Standard Deviation of Other Attributes	99
4.11	Summary of Average Mean and Coefficient for Attribute	100
4.12	Coefficient for Advance Compliance Module of ecotourES	100
4.13	Correlation Matrix for Safety Attribute	102
4.14	Correlation Matrix for Health Attribute	102
4.15	Correlation Matrix for Environment Attribute	103
4.16	Correlation Matrix for Other Attribute	103
4.17	KMO and Bartlett's Test Result	104
4.18	Extraction Communalities for Safety Factors	106
4.19	Extraction Communalities for Health Factors	106
4.20	Extraction Communalities for Environment Factors	107
4.21	Extraction Communalities for Other Factors	107
4.22	Total Variance Explained for Safety Attribute	109
4.23	Total Variance Explained for Health Attribute	109
4.24	Total Variance Explained for Environment Attribute	110
4.24	Total Variance Explained for Other Attribute	110
4.26	Factor Analysis on the Responses to Safety Attribute	115
4.27	Factor Analysis on the Responses to Health Attribute	116
4.28	Analysis on the Responses to Environment Attribute	117

4.29	Factor Analysis on the Responses to Other Attribute	118
5.1	Total Possible Questions and Options in ecotourES	124
5.2	5-Point Likert Scaling	124
5.3	Question 1 of Filtration Module	128
5.4	Question 2 of Filtration Module	128
5.5	Question 3 of Filtration Module	128
5.6	Question 4 of Filtration Module	128
5.7	Question 5 of Filtration Module	129
5.8	Question 6 of Filtration Module	129
5.9	Question 7 of Filtration Module	129
5.10	Question 8 of Filtration Module	129
5.11	Question 9 of Filtration Module	129
5.12	Question 10 of Filtration Module	130
5.13	Question 11 of Filtration Module	130
5.14	Question 12 of Filtration Module	130
5.15	Question 13 of Filtration Module	130
5.16	Question 1 of Basic Compliance Module	131
5.17	Question 2 of Basic Compliance Module	132
5.18	Question 3 of Basic Compliance Module	132
5.19	Question 4 of Basic Compliance Module	132
5.20	Question 5 of Basic Compliance Module	132
5.21	Question 6 of Basic Compliance Module	133
5.22	Question 10 of Advance Compliance Module for Marine Park and Islands Guidelines	135
5.23	Question 11 of Advance Compliance Module for Marine Park and Islands Guidelines	136
5.24	Question 12 of Advance Compliance Module for National Parks, Reserves and Other Forests Guidelines	137
5.25	Question 13 of Advance Compliance Module for National Parks, Reserves and Other Forests Guidelines	137
5.26	Question 14 of Advance Compliance Module for Mangrove Sites Guidelines	138
5.27	Question 15 of Advance Compliance Module for Mangrove Sites Guidelines	138
5.28	Question 16 of Advance Compliance Module for Recreational Forest Reserves Guidelines	139
5.29	Question 17 of Advance Compliance Module for Recreational Forest Reserves Guidelines	139
5.30	Question 18 of Advance Compliance Module for Limestone Hills and Caves Sites Guidelines	139
5.31	Question 19 of Advance Compliance Module for Limestone Hills and Caves Sites Guidelines	140
5.32	Question 20 of Advance Compliance Module for Rivers, Waterfalls and Lakes Guidelines	141
5.33	Question 21 of Advance Compliance Module for Rivers, Waterfalls and Lakes Guidelines	141
5.34	Question 22 of Advance Compliance Module for Beach Sites Guidelines	142
5.35	Question 23 of Advance Compliance Module for Beach Sites Guidelines	142

5.36	Question 24 of Advance Compliance Module for Montane Areas Guidelines	142
5.37	Question 25 of Advance Compliance Module for Montane Areas Guidelines	143
5.38	Question 26 of Advance Compliance Module for Carrying Capacity (CC) and the Limits of Acceptable Change (LAC)	144
5.39	Question 27 of Advance Compliance Module for Carrying Capacity (CC) and the Limits of Acceptable Change (LAC)	144
5.40	Question 28 of Advance Compliance Module for Carrying Capacity (CC) and the Limits of Acceptable Change (LAC)	144
5.41	Minimum and Actual Score Frame for Question 2 of the Filtration Module	159
5.42	Minimum and Actual Score Frame for Question 3 of the Filtration Module	159
5.43	Summary of Total Score for Question 3 and 4 of the Filtration Module	161
5.44	Validation Test Analysis: ecotourES Consultation	173
5.45	Orchid Rating Scale	174
5.46	Validation Test Analysis: Visitor Response (N=25)	175
5.47	ecotourES Consultation vs. Visitor Response	176

LIST OF FIGURES

Figure		Page
2.1	Tourist Arrivals in Asia and Asia Pacific	14
2.2	Map of Malaysia	16
2.3	Map of Pahang	17
2.4	Three Criteria of Ecotourism	27
2.5	Number of Potential and Existing Ecotourism Sites in Malaysia	31
2.6	Groups of Natural Resources	37
2.7	Basic Stages in Tourism Planning	43
2.8	Basic Study Procedures for Tourism Planning	44
2.9	Expert System Shell	57
2.10	Expert System Development Phases	58
3.1	Conceptual Framework of Research	70
3.2	Delphi Method	71
4.1	Size of Respondents Based on their Country of Origin	84
4.2	Breakdown of Respondent for International Tourist	85
4.3	Scree Plot for Safety Attribute	111
4.4	Scree Plot for Health Attribute	112
4.5	Scree Plot for Environment Attribute	112
4.6	Scree Plot for Other Attribute	113
5.1	Expert System Structure	119
5.2	User Interfacing with Database	121
5.3	Rule-based System Architecture for ecotourES	122
5.4	Inference Semantic Network and Coefficient for Filtration Module	127
5.5	Inference Semantic Network and Coefficient for Basic Module	131
5.6	Ecosystem Guidelines Inference Network	134
5.7	Inference Semantic Network and Coefficient for Advance Module	135
5.8	Basic Conceptual Design for System Database	146
5.9	Check Boxes and Radio Buttons User Input Form of ecotourES	147
5.10	System Prompted Error Message	147
5.11	Site Map of ecotourES	148
5.12	Main Web Page of ecotourES	149
5.13	Main Web Page of the Rating Module	149
5.14	Filtration Module with the Compliance Level Shown	150
5.15	The Summary Page to Terminate/Promote a User	151
5.16	Input Form for Database Record of the Site and ECO Rating	151
5.17	All Successful Transaction Would be Recorded in the Listing ASP	152
5.18	Ecotourism Guidelines Strategy Page	153
5.19	Ecotourism Sites Database for Peninsular Malaysia	153
5.20	Example of Database Information for Kedah Darul Aman	154
5.21	Ecotourism Site Diagnostic for Kedah Darul Aman	154
5.22	Ecotourism Site Images for Kedah Darul Aman	155
5.23	Data Flow for ecotourES Three Modules	157
5.24	ecotourES Data Flow	164
5.25	Cumulative score for ECO rating	166
5.26	The “HELP (Click Here for Further Explanation” hyperlink	167
5.27	Help Screen Shot from ecotourES	167
5.28	Location of Validation Test Site	168

5.29	Validation Site 1 – Gunung Tahan, Pahang	169
5.30	Validation Site 2 – Temenggor Dam, Perak	170
5.31	Validation Site 3 – Kampung Kuantan Fire Flies, Selangor	171
5.32	Validation Site 4 – Pulau Singha Besar, Langkawi, Kedah	172

LIST OF ABBREVIATIONS

AOTO	Association of Official Tourist Offices
ASP	Active Server Pages
CGI	Common Gateway Interface
CNTA	Chinese National Tourism Association
CPR	Cardio Pulmonary Resuscitation
CST	Certification in Sustainable Tourism
DOE	Department of Environment
FRIM	Forest Research Institute of Malaysia
GUI	Graphical User Interface
HTML	Hyper Text Mark-up Language
KMO	Kaiser-Meyer-Olkin Measure
NEAP	Nature and Ecotourism Accreditation Programme
NGO	Non Government Organisation
NSTA	National Science Teachers Association
SIRG	Services Industries Research Group
SQL	Standard Query Language
TCHT	Taylor's College School of Hospitality and Tourism
TIES	The International Ecotourism Society
UPM	Universiti Putra Malaysia
WTO	World Tourism Organisation
WWF	World Wide Fund For Nature

CHAPTER I

INTRODUCTION

1.1 Prologue

The earth's human societies are experiencing some of the most dramatic changes in history. Borders are dissolving and countries, societies, people and firms are connecting more and in different ways than they ever have in the past. International trade agreements, global business activities, telecommunication networks and personal and educational travels are linking the planet together like never before. These linkages are being forged and supported by two of the largest and fastest growing industries in the world today - tourism and information technology (Sheldon, 1997).

According to Waters (1995), tourism is well documented as the world's largest industry, contributing significantly to many national and regional economies. He further added that tourism was responsible for over 200 million jobs world wide in 1995. According to the World Travel and Tourism Council (2003), the travel and tourism economy account for 11.7% of world GDP in 1999, and this figure is expected to grow in years to come.

Tourism's position as the world's largest industry has led to the widespread acknowledgement of the decisive role it plays in shaping the global economy (Davidson, 1993). More recently, attention has also been focused on the

environmental and cultural impact of tourism, in particular on the physical and human environment of tourism destinations. With ever-unpredictable economic conditions, modified consumer behaviour and emergence of new technologies have created further expansion of the industry, and the impact has become increasingly pervasive. Tourism contributes significantly to the economies of developing countries. Growth has been more rapid there than in developed countries and has been continuous for several decades. The travel, tourism and hospitality industries have collectively achieved international and national recognition as one of the major social and economic forces of our times (Ritchie and Goeldner, 1994). Over the last decade, world competition in tourism has grown as more and more countries and regions realise both the desirability and the necessity of including tourism as a major component of their social and economic structure.

In Malaysia, tourism has become a major economic activity. The 2001/2002 Malaysian Economic Report showed that Malaysia's tourism receipt of 10% to GDP in 2001 was the highest in the region compared with Singapore (6%), Thailand (5.2%), Indonesia (3.8%), Philippines (2.4%) and South Korea (1.5%). In 2001, Malaysia's tourism sector, the second largest source of foreign exchange earnings after manufacturing sector, generated RM39.1 billion (\$10.3 billion) in earnings (10% of GDP) and earned no less than RM24 billion (\$6.3 billion) in foreign exchange. Nonetheless, development of domestic tourism market remains largely untapped. Domestic and regular leisure travel was not a common feature in Malaysian society despite rising domestic incomes and extensive promotional marketing efforts. Nevertheless, the extensive promotion by the Ministry of Culture, Arts and Tourism, Malaysia both internationally and locally for the last three years, have suddenly given

the tourism sector the limelight it deserved. Thus, it is envisaged that domestic tourism potential will be increasingly harnessed and developed.

Despite the economic slowdown after 1997, Malaysia has experienced tremendous increase in the development of the tourism industry. This has been made possible through incentive tourism related investments. This was complemented by the hosting of prominent international conferences and events namely the 1998 Commonwealth Games in Kuala Lumpur, the International Ecotourism Colloquium 2002, the 7th World Leisure Congress 2002 and the launching of Visit Malaysia Year campaigns and activities, both within and outside the country. At present, greater confidence prevails in the tourism sector with Malaysia enjoying a relatively high profile in the international market.

National tourism policies and strategies, focus on the efficient development of the tourism sector, while concurrently enhancing the quality of life of Malaysians and minimising possible detrimental socio-cultural and environmental effects. The potential of tourism sites is dependent on supporting facilities such as parks and protected areas, transportation, roads, solid waste collection and disposal, sewerage and drainage, water distribution systems and health care facilities (Department of Environment, 1991). As part of the environmental factors contributing to the tourism industry, the infrastructure needs to be improved. Without coordination and planning, service demands may exceed capacity, with adverse results for residents as well as tourists. Indirect linkages between tourism and local cultures, businesses, resident populations and workforces are potential problems. Failure to recognise them can

diminish project benefits as well as inflict adverse socio-economic impacts on the local population.

Malaysia is a tropical country that is substantially rich in a variety of ecological based sites. Abundantly green and home to over 11,000 known species of flora and fauna (Khairuddin, 1992). Malaysia is an ecological area of much tourist potential. This potential can be harnessed by developing successful destination for tourists.

Ecotourism is defined by the Ecotourism Society as, “Purposeful travel to natural areas to understand the culture and natural history of the environment, taking care not to alter the integrity of the ecosystem, while producing economic opportunities that make the conservation of the natural resources beneficial to local people” (Font and Buckley, 2001). The ecotourism concept emphasises the use of areas of ecological interest, managed forests and the vast areas of natural habitat. While having vast potential for further development, ecotourism has not received adequate attention in Malaysia as compared to developed countries like the United Kingdom, Holland, Germany, Italy, the United States of America, Australia and New Zealand. The development of ecotourism must be planned, guided and managed in a monitored and controlled manner. Effective and efficient management is necessary so that the project is feasible on a sustainable basis. Carried out in this way, it is hoped that the industry will provide for increased opportunities for economic development and expansion.

It is estimated that of the 10.2 million tourists arrival in Malaysia in 2000, 10 percent were nature lovers or eco-tourists (The Star, 2001). It was also reported in The Star that Taman Negara National Park is one of the more popular eco-tourist favourite, which may create a problem of overcrowding soon. With 60,000 tourists in 1997, the park is approaching its carrying capacity of 70,000 to 90,000. With Mulu Caves in Sarawak and Mount Kinabalu in Sabah receiving World Heritage Listing (UNEP World Conservation Monitoring Centre, 2002), and Endau Rompin in Johore acknowledged as one of the oldest rain forest in the world (IMSP, 2000; Johore National Park Corporation, 2001), the ecotourism industry in Malaysia is moving into a new era. Without proper enforcement and management, the tourism demand may not be sustainable.

1.2 Problem Statement

Modernization theorists argue that mass tourism development improves local economies and inhabitants' standard of living. Dependency theorists, however, contend that it strips precapitalist societies of their economic surplus, causes "economic leakage," leaves underdeveloped nations even more dependent on foreign imports, and ultimately destroys the socio-cultural framework of host countries (Khan, 1997). In contrast, ecotourism promotes preservation of natural ecosystems and local cultures while providing more egalitarian and locally controlled opportunities for economic growth.